



## Short Communication

# Personality, politics, and denial: Tolerance of ambiguity, political orientation and disbelief in climate change

Zohaib Jessani, Paul B. Harris\*

Rollins College, FL, United States



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## ABSTRACT

Denial of climate change may exacerbate the problem by impeding pro-environmental behavior and policy. An online survey of 219 US citizens assessed tolerance of ambiguity, political orientation, and beliefs about climate change. Results indicated that low tolerance of ambiguity predicted beliefs that: 1) climate change is not a problem; 2) is not the result of human activity, and; 3) cannot be corrected through individual behavior. Analyses also supported that these relationships were mediated by conservative political orientation. The link between conservative politics and refusal to accept climate science may reflect a proximate relationship; personality characteristics, like tolerance of ambiguity, may ultimately be responsible for drawing people to both political and environmental ideologies.

Beliefs about climate change in the United States can be driven as much by politics as by science (Pew Research Center, 2016). However, knowing conservatives view climate in one way and liberals in another has limited utility if we do not know the underlying characteristics that lead people to their political views and environmental beliefs. In our study we explored a mediated model in which Tolerance of Ambiguity (TA) (Frenkel-Brunswik, 1949; Furnham & Marks, 2013) relates to political orientation and, through this ideology, predicts beliefs about climate change. We propose that low TA individuals are more likely to identify as conservative (Jost et al., 2007; Kohn, 1974; Sidanius, 1978) and, given the complex explanations associated with climate science, are more likely to deny climate change.

Disbelief in climate science has taken many forms during the past two decades. Earlier studies (e.g., Dunlap & McCright, 2008; Gallup Poll, 2008) indicated that conservatives were less likely to believe the scientific evidence documenting a rise in the Earth's temperature (i.e., to believe that climate change was a legitimate problem). A more recent survey of Americans (Pew Research Center, 2016) indicated that this type of denial was less prevalent but still existed; 63% of conservative republicans believed climate change was real compared to 93% of liberal democrats. This difference was less pronounced in moderate republicans (80%) and democrats (85%), most of whom acknowledge climate change.

Although conservatives are becoming more accepting of the existence of climate change, there is still disbelief that the problem is anthropogenic – i.e., caused by human behavior (Leiserowitz, Maibach, Roser-Renouf, Feinberg, & Rosenthal, 2014; McCright & Dunlap, 2011;

McCright, Dunlap, & Xiao, 2013). Returning to the Pew (2016) survey, only 15% of conservative republicans believed climate change was anthropogenic compared to 79% of liberal democrats. While not as extreme, this gap was still pronounced when comparing moderate republicans (34%) and democrats (63%).

Finally, it is possible to believe climate change is real and anthropogenic but still not believe that human action can solve problem. The Pew Research Center (2016) survey found conservative Republicans were less than half as likely as liberal democrats to believe that climate change could be addressed through policy changes (e.g., controlling power plant emissions) and individual behaviors (e.g., lowering carbon footprint). These differences were less pronounced or nonexistent among moderates.

All three forms of climate disbelief (i.e., denying its existence, its anthropogenic origins, and its ability to be controlled) are a problem in that they alleviate individual responsibility to address the issue through legislation or personal behavior. However, political orientation is likely a proximate cause of environmental beliefs. People are drawn to political ideologies based on a combination of personality traits and situational variables (Feldman & Johnston, 2014; Jost, Nosek, & Gosling, 2008); it is likely that some subset of these variables is responsible for the relationship between political orientation and climate beliefs. Tolerance of Ambiguity is one trait that has been associated with political ideology (Jost et al., 2007; Kohn, 1974; Sidanius, 1978). Budner (1962) defined TA as “the tendency to perceive ambiguous situations as desirable” (p. 30). On the other end of the dimension, Frenkel-Brunswik (1949) described low TA individuals as having “a tendency to resort to

\* Corresponding author.

E-mail address: [pharris@rollins.edu](mailto:pharris@rollins.edu) (P.B. Harris).

black-and-white solutions, to arrive at premature closure...often at the neglect of reality” (p. 119). Research has supported that low TA individuals are more likely to be politically conservative (Jost et al., 2007; Kohn, 1974; Sidanius, 1978).

Could TA also relate to acceptance of climate science? Although there is little research testing this hypothesis, there is indirect support from research on the Big Five trait of Openness. Openness is a trait that relates to the “breadth, depth, originality, and complexity of an individual's mental and experiential life” (John, Naumann, & Soto, 2008, p. 120). Research indicates that there are positive relationships between measures of Openness and TA, with open people finding complex information less threatening (Bardi, Guerra, Sharadeh, & Ramdeny, 2009; Caligiuri & Tarique, 2012). Openness has also relates to political orientation, with open people more likely to identify as liberal (Carney, Jost, Gosling, & Potter, 2008; Cooper, Golden, & Socha, 2013; Jost et al., 2008). Finally, Openness has relates to environmental beliefs, with open people more likely to report pro-environmental attitudes and behavior (Brick & Lewis, 2016; Hilbig, Zettler, Moshagen, & Heydasch, 2013; Markowitz, Goldberg, Ashton, & Lee, 2012). Referring specifically to climate change, Brick and Lewis (2016) proposed that “Openness is characterized by flexible, abstract thinking, exactly what is necessary to imagine long-term and long-distance environmental consequences such as those associated with climate change” (p. 638). While Openness and TA are distinct concepts, their relationship may indicate that the ability for “flexible, abstract thinking” also requires individuals to be comfortable with uncertain or ambiguous information.

In this study we are proposing a mediational model linking TA with climate change beliefs through its relationship with political orientation. Three environmental beliefs will be targeted: 1) climate change is a problem; 2) climate change is anthropogenic, and; 3) individual behavior can help curb climate change. To support a mediated relationship, three conditions must be met (Hayes, 2013; Preacher & Hayes, 2008): 1) TA must directly predict climate change beliefs; 2) political orientation, must be predicted by TA and must also predict climate change beliefs, and; 3) the relationship between TA and climate beliefs must decrease significantly when political orientation enters the equation, indicating that a significant portion of the relationship between TA and climate beliefs is mediated through political orientation.

## 1. Method

### 1.1. Procedure and participants

Our study involved an online questionnaire distributed by the crowdsourcing site Amazon Mechanical Turk (MTurk). The 219 paid volunteers who met our criteria included 109 female and 110 male participants who identified their nationality as American. The sample was primarily white (78%) and ranged in age from 19 to 75 ( $Mdn = 33$ ,  $M = 37.08$ ,  $SD = 12.24$ ).

### 1.2. Measures

Our questionnaire included measures of TA, political orientation, and beliefs about climate change (see Table 1). TA was measured with Budner's (1962) 16-item Intolerance of Ambiguity Scale, recoded so higher numbers indicated greater tolerance. Political orientation was assessed with four items (Cronbach's  $\alpha = 0.95$ ) asking participants to rate their political views in general, and on economic policy, foreign policy, and social issues, using a 7-point scale from *very conservative* to *very liberal*. Three types of beliefs about climate change were measured using 7-point Likert items: belief that climate change is a problem (8 items,  $\alpha = 0.95$ ), belief that climate change is anthropogenic (5 items,  $\alpha = 0.92$ ), and participants' beliefs that their behavior could help control climate change (4 items,  $\alpha = 0.91$ ).

**Table 1**

Descriptive Statistics for TA, Political Orientation and Climate Change Beliefs.

	<i>M</i>	<i>SD</i>	Pearson correlation coefficients			
			1	2	3	4
1. Tolerance of ambiguity	53.00	10.32	–			
2. Liberal political orientation	4.61	1.71	0.27	–		
3. Climate change is a problem	5.30	1.53	0.32	0.60	–	
4. Climate change is anthropogenic	5.49	1.48	0.30	0.61	0.88	–
5. I can control climate change	4.84	1.56	0.23	0.44	0.71	0.74

Note.  $N = 219$ . All correlations were significant at  $p < 0.01$ .

## 2. Results

Consistent with literature on MTurk (Huff & Tingley, 2015), our sample trends Democrat (44% versus 21% Republicans and 32% independent) and liberal. Political orientation scores identified 28% conservative participants (scores between 1 and 3.5), 17% moderates (3.75–4.25), and 55% liberals (4.5–7). Extreme views were less common, with 4% scoring 1–1.5 (very conservative) and 15% scoring 6.5–7 (very liberal). Although MTurk samples are “left-leaning,” they may be comparable to other national web-based and face-to-face samples when relating examining personality and political orientation (Clifford, Jewell, & Waggoner, 2015).

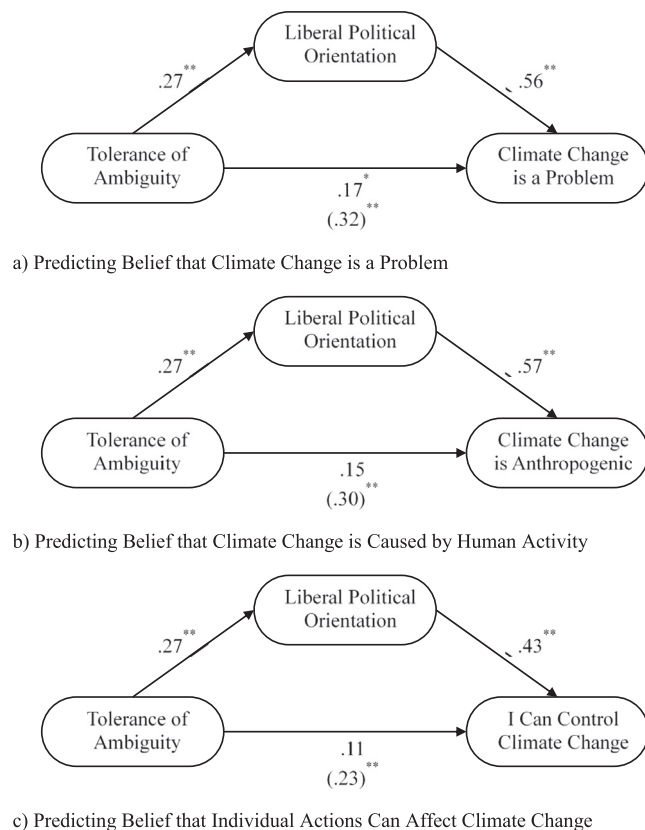
As indicated in Table 1, all our variables were significantly related to each other. However, we were specifically interested in whether the relationship between TA and climate change beliefs was mediated by political orientation. Fig. 1 illustrates three models that were analyzed separately for our three climate belief scales. Gender was excluded from the analyses because it was not a significant correlate. However, older participants were more likely to identify as conservative,  $r = -0.24$ ,  $p < 0.01$ , so age was treated as a covariate.

Mediation was supported in all three of the models; TA predicted both political orientation (top left arrows) and climate beliefs (bottom arrows, coefficients in parentheses). Political orientation also predicted climate beliefs (top right arrows). Finally, the relationship between TA and climate beliefs was significantly reduced by including political orientation (bottom arrows, coefficients not in parentheses). Note that in the second and third models the mediator reduced the TA-belief coefficients below the level of significance.

Multiple Regression including TA and political orientation as predictors indicated significant results for belief that climate change is a problem (first model),  $R^2 = 0.38$ ,  $F(3,215) = 44.72$ ,  $p < 0.01$ , is anthropogenic (second model),  $R^2 = 0.39$ ,  $F(3,215) = 45.67$ ,  $p < 0.01$ , and can be affected by individual action (third model),  $R^2 = 0.21$ ,  $F(3,215) = 19.36$ ,  $p < 0.01$ . For all three models, a bootstrap estimation approaches with 1000 samples (Hayes, 2013; Preacher & Hayes, 2008) supported significant mediated relationships, with political orientation accounting for 47% of the relationship between TA and belief that climate change was a problem (95% CI = 0.08 to 0.24), 51% of the relationship predicting belief in anthropogenic climate change (95% CI = 0.08 to 0.24), and 50% of the relationship predicting belief that climate change can be affected by individual action (95% CI = 0.06 to 0.19).

## 3. Discussion

Consistent with previous research, we found that participants lower in TA tended to be more conservative (Jost et al., 2007; Kohn, 1974; Sidanius, 1978) and that more conservative participants were more likely to deny climate change (Marlon, Leiserowitz, & Feinberg, 2013;



**Fig. 1.** Models showing political orientation as a mediator between TA and climate beliefs. All coefficients are standardized. Coefficients in parentheses exclude political orientation.

\* $p < 0.05$ . \*\* $p < 0.01$ .

McCright & Dunlap, 2011). Extending on this research, we found that low TA individuals also tend to deny climate change and that this relationship was mediated by political orientation.

Why would low TA individuals be more likely to deny climate change? Bochner (1965) characterized TAs as having “a preference of familiar over unfamiliar” and “rejection of the unusual or the different” (p. 394). Science concerning anthropogenic climate change is fairly new which may push low TA individuals towards more familiar explanations like the earth warming due to natural fluctuations in the weather. It is also possible low TA people reject scientific explanations because they tend to be complex and lack definitive conclusions. Scientists communicate in terms of available evidence and probabilities which may, because of its ambiguous nature, be repellent to low TA individuals.

We realize the limitations of this study in terms of its correlational nature, sample size and composition, and restricted number of variables. However, we believe a mediated approach to predicting climate beliefs and, ultimately, environmental behaviors, has value. Given our current politically charged culture, it is easy to attribute environmental beliefs to group membership and leave it at that. This may actually be a form of political stereotyping that allows easier but perhaps less accurate processing of information about others. People do not just adopt political ideologies at random, they are drawn to certain perspectives because of their personality and their situations (Feldman & Johnston, 2014; Jost et al., 2008). The literature indicates climate beliefs are related to a variety of other individual difference variables including Big Five traits like openness, extraversion, conscientiousness, and agreeableness (Brick & Lewis, 2016; Milfont, Milojev, Greaves, & Sibley, 2015), as well as authoritarianism, empathy, and social dominance orientation (Häkkinen & Akrami, 2014; Jylhä & Akrami, 2015). What is

not well understood is how these variables relate to political affiliation. Future research might identify characteristics that directly relate to climate beliefs but not to politics, to politics but not climate beliefs, and traits that relate to climate beliefs mediated through politics.

Research on factors that predict political orientation and ultimately, climate change beliefs, is crucial to the development of effective pro-environmental policies. For example, couching climate information and interventions in a language that is more familiar to low TA conservatives might make the science behind this issue less ambiguous and hopefully more palatable. Attempts to change minds and change behaviors can only benefit from a better understanding of who is denying climate change and the motivation behind this denial.

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